Waste Encapsulation Storage Facility

Restore the River Corridor - Transition the Central Plateau - Prepare for the Future

A capsule is inspected using manipulators in a WESF hot cell

This closed loop cooling system removes heat generated by the capsules stored in the WESF pools

WESF hot cells with manipulators where the capsules were produced in 225-B.

Background

Highly radioactive cesium and strontium capsules are stored under 13 feet of water

The Waste Encapsulation and Storage Facility provides safe storage and monitoring of radioactive cesium and strontium capsules at Hanford.

WESF operated from 1974 to 1985 to encapsulate cesium and strontium separated from high-level waste in the adjoining B Plant. Separation of these radionuclides reduced heat generated in the tank farm wastes and provided an opportunity to explore beneficial uses of the separated radionuclides. In the late 1970s and early 1980s, some cesium capsules were leased to companies that used the capsule radiation for processes that ranged from strengthening wood to sterilizing medical supplies.

In 1990, after one of the capsules developed a microscopic leak, the capsules were recalled and returned to Hanford over a period of years for storage at WESF. Several of the cesium capsules were overpacked to ensure their integrity. The final overpacked capsule was placed in pool storage in January 2000.

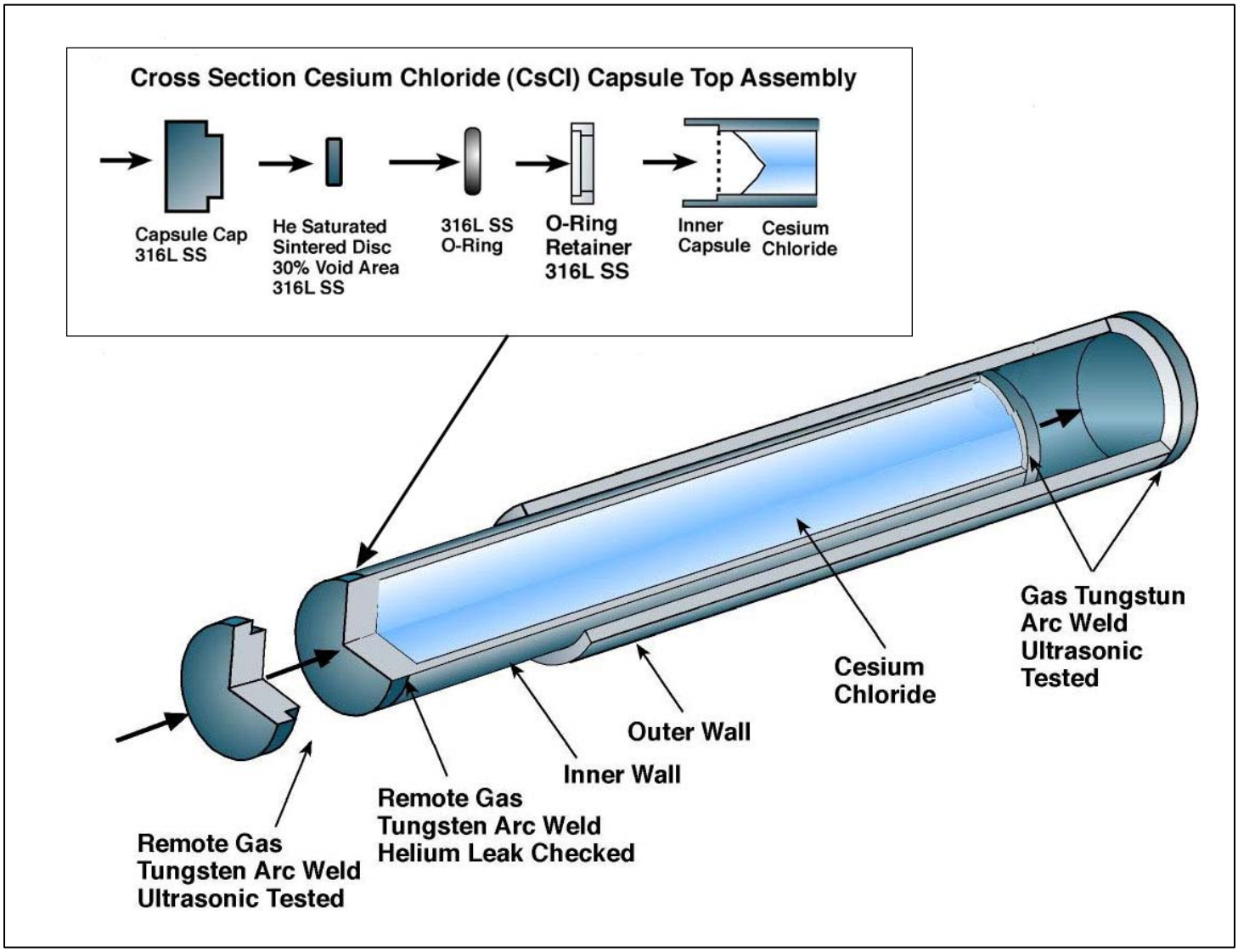
In the late 1990s, the assumption was that the cesium and strontium would be vitrified or turned into a stable glass form for disposal at a

QUICK FACTS

Original Production	**1,577 cesium capsules** **640 strontium capsules**
Current Inventory	**1,312 cesium capsules** **23 overpacked cesium capsules** **601 strontium capsules**
Radioactivity (as of 8/8/06)	**Cesium 41.6 million curies (MCi)** **Strontium 17.8 MCi** **Total 59.4 MCi** **(108.8 MCi, including daughter products)**
Heat Generation (as of 8/8/06)	**315 kilowatts (1.08 million BTU/hour)**
Special Features	**Seven hot cells** **12 storage/transfer pools**

national geologic repository. More recently, plans have shifted to repackaging the cesium and strontium and shipping to a repository without being glassified. The 1,936 stored capsules contain about 109 million curies, roughly a third of the total radioactivity of Hanford Site wastes. The radioactivity will decay to background levels in a little less than 300 years.

The present storage configuration for the capsules at WESF presents challenges including annual surveillance and maintenance costs. Current long-range plans call for placing the capsules in dry storage, much like the concept used by commercial spent fuel storage systems.



Cutaway diagram of a typical cesium capsule. The cladding is 316L stainless steel. The outside dimensions are 20.8 inches long and 2.6 inches in diameter.

For more information

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